

**WHAT IS CLAIMED IS :**

1      1.     A reel-deployable printed circuit board comprising:  
2                  an elongated, flexible base board having opposite edges and a slit formed into  
3                  it, the slit having an inner periphery defining a unit board within the flexible base  
4                  board; and,  
5                  a connection bar connecting the unit board to the base board such that the unit  
6                  board is pivotable on the connection bar relative to the base board.

1      2.     The circuit board of Claim 1, further comprising:  
2                  a bonding pad on a top surface of the unit board;  
3                  a contact on a bottom surface of the unit board; and,  
4                  a via hole through the unit board electrically connecting the bonding pad to the  
5                  contact.

1      3.     The circuit board of Claim 2, wherein the contact comprises a layer of copper plated  
2        with gold.

1      4.     The circuit board of Claim 1, further comprising a dam inside the inner periphery of  
2        the slit.

1      5.     The circuit board of Claim 1, wherein the base board is made of a glass-epoxy mate-  
2        rial.

1      6.     The circuit board of Claim 1, wherein the base board includes a sprocket hole along at  
2        least one of the edges thereof.

1       7.     The circuit board of Claim 1, wherein the base board includes a position hole along  
2     one of the edges thereof.

1       8.     The circuit board of Claim 2, further comprising:

2              a semiconductor chip attached to an upper surface of the unit board, the chip

3              having a connection pad on an upper surface thereof; and,

4              a conductive wire having opposite ends, each bonded to a respective one of the

5              bonding pad on the unit board and the connection pad on the chip.

1       9.     The circuit board of Claim 8, further comprising an encapsulant formed on the top  
2     surface of the unit board and encapsulating a region including the chip, the conductive wire,  
3     the bonding pad, and the connection pad.

1       10.    A method for manufacturing a semiconductor package using a reel-deployable printed  
2     circuit board, comprising:

3              (A) forming a printed circuit board comprising an elongated, flexible base board hav-  
4     ing opposite edges and a slit cut through it, the slit defining a unit board within the flexible  
5     base board that is connected to the base board and pivotable relative to it by means of a con-  
6     nection bar extending between the two boards in a direction perpendicular to the long direc-  
7     tion of the base board, the unit board having top and bottom surfaces, a bonding pad on the  
8     top surface, a contact on the bottom surface, and a via hole electrically connecting the contact  
9     with the bonding pad;

10              (B) attaching a semiconductor chip to the top surface of the unit board;

11              (C) electrically connecting the semiconductor chip to the bonding pad; and,

12              (D) encapsulating the top surface of the unit board with an encapsulant in a region in-  
13     cluding the semiconductor chip and the bonding pad.

1    11.    The method of claim 10, wherein a plurality of semiconductor packages are simultaneously manufactured on the printed circuit board, and further comprising: separating the encapsulated unit boards from the flexible base board by cutting the connection bars.

1    12.    The method of Claim 10, further comprising:

2                 winding the printed circuit board onto a cylindrical reel to store the board and

3                 - to transport the board from one manufacturing station to another manufacturing station; and,

4                 unwinding the printed circuit board from the reel to perform a manufacturing

5                 operation on the board.

1    13.    The method of claim 10, further comprising forming a dam on the top surface of the unit board to prevent runoff of a liquid encapsulant.

1    14.    The method of claim 10, wherein the flexible base board is formed from a glass-epoxy material.

1    15.    The method of claim 10, further comprising forming a sprocket hole along at least one of the edges of the flexible base board.

1    16.    The method of claim 10, further comprising forming a position hole along an edge of the flexible base board.

1    17.    The method of claim 10, wherein encapsulating the unit board further comprises:

2                 dispensing a liquid encapsulant into the region; and,

3                 curing the liquid encapsulant.

1    18. The method of claim 10, wherein encapsulating the unit board further comprises:  
2        disposing a mold over the unit board;  
3        transferring a molten encapsulant into the mold; and,  
4        solidifying the encapsulant.

1    19. The method of claim 10, wherein electrically connecting the semiconductor chip to  
2        the bonding pad further comprises bonding a wire having opposite ends to respective ones of  
3        the bonding pad and the chip.

1    20. The method of claim 10, wherein electrically connecting the semiconductor chip to  
2        the bonding pad further comprises:

3                forming a ball of conductive metal on the bonding pad or on a connection pad  
4        formed on a surface of the chip;  
5                orienting the chip with respect to the unit board such that the bonding pad and  
6        the connecting pad are opposed to each other, with the conductive metal ball inter-  
7        posed therebetween; and,  
8                melting the ball such that it electrically connects the pads to each other.